What is claimed is:

1. A method for searching an algebraic codebook in algebraic code excited linear prediction (ACELP) vocoding using a depth first tree method, the method comprising the steps of:

a) searching nodes of a tree at predetermined levels in order to predict a branch in which optimum pulse is located;

b) choosing a predetermined number of branches according to the search result of the step a) and removing residual branches; and

c) searching the chosen branches and choosing optimum algebraic code.

2. The method as recited in claim 1, wherein step a) includes the steps of:

a1) determining a level 'L' at which branches are searched;

a2) finding maximum values of each track;

a3) fixing a maximum value in total tracks as a first pulse;

a4) fixing a maximum value in a next track blow the track at which the first pulse is found as a second pulse;

a5) searching a third pulse and a forth pulse at next two tracks below the track at which the second pulse is found; and

a6) fixing other maximum value except the first pulse as the second pulse and executing the step a5).

3. The method as recited in claim 1, wherein T number of branches is chosen based on an equation as:

$$T_k = \frac{(C_k)^2}{E_k} = \frac{(Hxc_k)^2}{c_k' H' H c_k} = \frac{(d' c_k)^2}{c_k' \Phi c_k} \quad ,$$

wherein E_k represents energy of synthesized signal, C_k means correlation between target signal and synthesized signal, x is a target signal from which a predicted gain of an adaptive codebook is removed, H is a lower triangular toepliz convolution matrix, H^t is a transposed matrix of H, c_x is an algebraic code vector, c_x^t is a transposed matrix of c_x, d is a reverse filtered target signal, d^t is a transposed matrix of d, Φ is a correlation matrix of $h(n)$, which is impulse response.

4. The method as recited in claim 1, wherein in case of searching locations of two pulses in each track that has locations of 8 pulses in the algebraic codebook that has 5 tracks, the number of searching at a predetermined level 'L' is 4×L×(8×8) times.

5. The method as recited in claim 4, wherein the number of searching a predetermined number of chosen branches 'T' is T×(4-L) ×(8×8) times.

6. The method as recited in claim 1, wherein in case of searching locations of two pulses in each track that has

locations of 8 pulses in the algebraic codebook that has 5 tracks, a total number of searching is $4\times L\times(8\times 8)+T\times(4-L)\times(8\times 8)$ times.